CURRENT LITERATURE
IN
AGRICULTURAL ENGINEERING

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ENGINEERING

WASHINGTON, D. C.

Vol. 2, No. 11. June, 1933.

Agricultural Engineering.

Inexpensive changes cut farm costs. By S. H. McCrory. Farm Machinery and Equipment, no. 1792. April 15, 1933. p. 16. Work of Bureau of Agricultural Engineering on farm structures, drainage, irrigation, soil erosion and improvement.

Agriculture.

Inflation and the farm problem. By Berry H. Akers. Farmer. v. 51, no.5. March 4, 1933. p. 3, 18. Analysis of suggestions for changing the money system.

New day is dawning on the farm. By Henry A. Wallace. Montana Farmer. v. 20, no. 15. April 1, 1933. p.3.

Research always chief end of Department of Agriculture. By Henry A. Wallace. Science News Letter. v. 23, no. 631. May 13, 1933. p. 302.

Sole purpose is to raise prices. By George N. Peek. Implement and Tractor Trade Journal. v. 48, no. 10. May 20, 1933. p. 13. Administration of Agricultural Adjustment Act.

Some suggestions for organizing the farm business. By J. F. Harriott. 1933. 12 p. Cornell University. Extension Service. Extension bulletin no. 250.

Statement of objectives for agriculture. Formulated by committee on agricultural philosophy and objectives of Iowa State College, and approved unanimously by the Agricultural staff of college. 1933. 70p. Iowa State College of Agriculture and Mechanic Arts.

Tillage practices for southwestern Kansas. By R. L. von Trebra and F. A. Wagner. 1932. 17p. Kansas. Agricultural Experiment Station. Bulletin no. 262.

Type-of-farming areas in Ohio. By J.H. Sitterley and J. I. Falconer. 1933. 10p. Mimeographed. Ohio Agricultural Experiment Station. Mimeographed bulletin no. 56.

Yearbook of Agriculture, 1933. Washington, U. S. Government Printing Office, 1933. 789p.

Air Conditioning.

Air conditioner and furnace in one. Popular Mechanics Magazine. v. 59, no. 3. March, 1933. p. 373. Cleans, humidifies, heats and circulates air in winter and delivers cool air in summer. Four to six complete changes every hour. Special control automatically prevents blower from delivering cold air during heating season.

Air-conditioner in ceiling saves floor space. Popular Mechanics Magazine. v. 59, no. 3. March, 1933. p. 361. Device may be used with either ice or mechanical refrigeration. Fan draws upper air of room between fins of cooling surfaces. Excess moisture is removed, and cool air is discharged at any desired angle toward ceiling. Pipes connect with ice-melting tank or refrigerator. During cooler weather, system can be connected with cold-water supply, reducing operating costs.

Air conditioning. By Professor A. I. Brown. Engineering Experiment Station News. Ohio State University. v. 5, no. 1. February, 1933. p. 3, 15-20. What is air conditioning?; Air conditioning for comfort and health; Air conditioning in industry; Air conditioning for offices; Air conditioning for the home; Heating in winter and cooling in summer; Adapting the heating plant to air conditioning.

Air conditioning - the conqueror of hay fever. By Horace W. Pote. Aerologist. v. 9, no. 6. June, 1933. p. 8-9. Scientists point way to new ways to merchandise air conditioning equipment.

Electric humidifier in home conditions air cheaply. Popular Mechanics. v. 59, no. 4. April, 1933. p. 560. Air is filtered, humidified and circulated without use of a duct system by humidifier developed by General Electric Company, that will serve entire home. Electricity is used at same rate as single incandescent lamp. Complete change of air in lower part of house is effected in forty minutes. Installed on first floor, humidifier takes air from basement, removes dust by passing it through filter and then sends it through water chamber to pick up moisture. Air then is forced out discharge grill by fan and returns to basement through grill at opposite side of house.

Energy requirements for air conditioning of homes. By D. W. McLenegan. Electrical World. v. 101, no. 20. May 20, 1933. p. 644-647. Conclusions derived from extensive analysis of year-round air conditioning of homes are as follows: Use of automatic heating and winter air-conditioning equipment gives rise to electrical load which is larger, per unit, than domestic refrigerator load and which, in general, has desirable characteristics. 2. House-cooling equipment is available in several types, with varying electrical requirements. Size of equipment required can be reduced materially if suitable house-shielding equipment is used and if requirements for air conditioning are considered in design of new buildings. 3. Power demand of complete house-cooling plant is large enough to warrant installation of separate polyphase power supply. Plant adequate for two rooms is generally within limits of single-phase house distribution. 4. If operating cycle of cooling equipment adds unduly to existing peak of domestic load it is possible to design equipment for off-peak operation, provided savings in operating cost can be

Air Conditioning. (Cont'd.)

realized to offset increased investment. 5. Without resorting to cooling plant, considerable improvement in summer comfort may be secured by installation of ventilating fans, which involve relatively small first cost and operating cost. For winter use devices to humidify and circulate air provide similar advantages.

Heat conductivity of wood at climatic temperature differences. By F. B. Rowley. Heating, Piping and Air Conditioning. v. 5, no. 6. June, 1933. p. 313-323. Cooperative research project between American Society of Heating and Ventilating Engineers, National Lumber Manufacturers' Association, and University of Minnesota. Density - Moisture and conductivity moisture relations; conductivity-density relation.

Indices of air change and air distribution. By F. C. Houghten and J. L. Blackshaw. Heating, Piping and Air Conditioning. v. 5, no. 6. June, 1933. p. 324-330.

Science of air conditioning. Ice and Cold Storage. v. 36, no. 421. April, 1933. p. 66-67. Fundamentals and definitions. Dry and wet bulb thermometers. The psychrometric chart and its use.

Associations.

Program of the 27th Annual Meeting American Society of Agricultural Engineers. Purdue University, Lafayette, Indiana. June 21, 22, 23 and 24, 1933. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 138-139.

Building Construction.

And now fabricated lumber. By Paul E. Kendall. Printers' Ink. v. 162, no. 4. January 26, 1933. p. 33-34. Enterlocking fabricated building lumber.

Comparative details - Interior woodwork. Pencil Points. v. 14, no. 5. May, 1933. p. 217-220.

Concrete building units. 2d edition. December 15, 1932. Washington, U.S. Government Printing Office, 1933. 12p. Simplified practice recommendation R32-32.

Glass building brick takes practical form. American Builder. v. 54, no.4. January, 1933. p. 32. Uniform size and shape and supported by full bed of mortar.

New products: wood, textiles, paper. The Architectural Record. v. 73, no. 4. April, 1933. p. 295-301. Waterproof plywood: laminating with phenolic resins. Wood-metal plies; elastic glue. Plywood: concrete forms. Fireproof wood. Flexwood: new adhesive. New wood products: masonite cushioned flooring, solka, "enterlocking fabricated building lumber", "floorantile unit; evanite spring, expansion joints, "Thin-type bloxonend flooring", balsam wood insulation, nu-wood bevel-lap plank.

New wood tile is tried out for building purposes. By Harry D. Tiemann. American Builder. v. 54, no. 4. January, 1933. p. 32-33. "Interlocking wood tiles".

Building Construction. (Cont'd)

Reinforced brickwork tests. By J. R. Shank. Engineering Experiment Station News. Ohio State University. v. 5, no. 1. February, 1933. p. 1-3, 13-14.

Style review, - new and tested products. American Builder and Building Age. v. 55, no. 1. April, 1933. p. 14-19, 56, 58. Foundations. Outside walls. Insulation. Framing. Roofing. Windows and frames. Floorings. Inside walls and wall coverings. Heating and conditioning.

Chimneys.

Comparative details - chimneys. Pencil Points. v. 14, no. 4. April, 1933. p. 185-189.

Cotton.

Costs of ginning cotton. By Dr. A. B. Cox. Cotton Ginners' Journal. v. 4, no. 8. May, 1933. p. 5, 12-13. Discussion of external ginning costs.

Cotton ginner and agricultural development. By A. L. Ward. Cotton Ginners' Journal. v. 4, no. 8. May, 1933. p. 7, 15.

Dairy Equipment.

Electric steam sterilization and water heating in the dairy. 1933. 40p. College Park, Md., National Rural Electric Project. Report no. 7.

Electric Service, Rural.

Builds rural line for $865 per mile. Electrical World. v. 101, no.15. April 15, 1933. p. 483.

Electricity on the Farm.

Electrical heating in horticulture. Rural Electrification and Electro-Farming. v. 8, no. 96. May, 1933. p. 364-366.

Electricity in mechanised farming. By H. J. Denham. 1933. 9p. Institute for Research in Agricultural Engineering. University of Oxford. Reprinted from the Scottish Journal of Agriculture. v. 16, no. 2.

Filling the mows with chopped hay. By T. E. Heinton. Electricity on the Farm. v. 6, no. 6. June, 1933. p. 8-9. Results of tests. Chopped hay easy to handle.

Unit figures on Oklahoma rural use. Electrical World. v. 101, no. 22. June 3, 1933. p. 718. Based on Oklahoma Agricultural Experiment Station bulletin 207. Monthly consumption of 1.1 kw.-hr. for house water supply, 58.6 kw.-hr. for refrigeration, 2.7 kw.-hr. for washing clothes, 1.62 kw.-hr. per cow for milking, 2.15 kw.- hr. for cooling 100 lb. of milk, 0.8 kw.-hr.per

Electricity on the Farm. (Cont'd)

100 lbs. of feed ground and 47 kw.- hr. per 1,000 eggs incubated represents cost above that for service of only power charge. It is in use of such equipment that solution of low-cost electricity for farm home lies.

Engines.

Effect of varying compression ratio and inlet temperature on engine performance. By G. W. Hobbs and M. L. Surls, 1933. 15p. Michigan Engineering Experiment Station. Bulletin no. 50.

Gas-saving engine for autos has unusual design. Popular Mechanics. v. 59, no. 4. April, 1933. p. 504. New cycle of operation developed by Prof. Hamilton Johnson, of Baton Rouge, La., is basis for engine. Professor Johnson's engine is arranged so volume of combustion chamber and time of closing inlet valve during compression stroke may be varied while car is in motion. Piston which moves up or down in cylinder to increase or decrease volume of combustion chamber, is operated by small electric motor. Switch on dash permits driver to increase his speed by starting mechanism which moves regulating pistons up, increasing the energy output of engine. At desired rate of speed, switch is released and car continues at its new rate. In Johnson engine, compression pressure air-fuel ratio, explosion pressure and percentage of dilution of fresh charge with burned-out gases from previous stroke, all remain constant, regardless of speed of car.

Internal combustion engine. By J. A. Pelsen. New York. John Wiley & Sons, Inc., 1931, 475p.

Erosion Control.

Farm losses from farm erosion. By H. B. Roe. Implement & Tractor Trade Journal. v. 48, no. 11. June 3, 1933. p. 10. Terraces are needed to maintain fertility on sloping fields, which means more work for farmers' equipment.

"Hard-time" methods check soil erosion. Farm and Ranch. v. 52, no. 8. April 15, 1933. p. 16. These are strip cropping and control of gullies with bluegrass sod.

Runoff and erosion studied in tests in California. Engineering News-Record. v. 110, no. 22. June 1, 1933. p. 711. To provide large-scale field tests on effect of vegetation cover on runoff and erosion of watershed areas, three dams and lined reservoirs are being built in the Angeles National Forest, Calif. Funds have been appropriated under Emergency Improvement Act, and it is planned to complete work with men from Conservation Corps, both provisions offering unemployment relief. Reservoirs will be of 10,000-cu.ft. capacity each and will be concrete-lined. They will be formed by the construction of three slab-and-buttress type dams about 15 ft. high and 30 ft. long. Immediately above each reservoir will be installed measuring flumes and weirs to determine the flow. Located on Bell Canyon, on the Big Dalton Canyon in the San

Erosion Control. (Cont'd)

Gabriel mountains, the tributary watershed areas are 6,580 and 104 acres, respectively. Program of study includes obtaining data from each of watershed areas in their natural condition for five-year period, as basic information. Then, one of areas will be burned and maintained in barren state, another will be burned and allowed to return to its natural condition, and third will be kept with its present cover as control. Flumes will be used to measure streamflow from 3 to 50 sec.-ft., and arrangement provides that flows of less than 3 sec.-ft. can be measured with V-notch weir. Flow-measuring devices are all equipped with recording gages. Silt washed down by streams will be measured in concrete-lined reservoirs.

Evaporation.

Effect of altitude on evaporation. Carl Rohwer. Cornell Civil Engineer. v. 41, no. 6. March, 1933. p. 94-96.

Evaporation for water surfaces: Symposium. American Society of Civil Engineers. Proceedings. v. 59, no. 5. May, 1933. p. 901-905. Discussion by R. R. Randell, C. E. Grunsky and C. H. Lee.

Evaporation from salt solutions and from oil covered water surfaces. By Carl Rohwer. Journal of Agricultural Research. v. 46, no. 8. April 15, 1933. p. 715-729. Effect of oil on evaporation; Effect of sodium chloride on evaporation; Effect of sodium sulphate on evaporation; summary.

Explosives.

New method of blasting swamp for highway fill. By Charles L. Wooley. Engineering News-Record. v. 110, no. 22. June 1, 1933. p. 715-717. Alternate layers of mud and sand are cut through by blasting trench full width before depositing fill. New methods of placing explosives developed.

Extension.

More purchasing power for farmers. By H. A. Wallace. Extension Service Review. v. 4, no. 3. May, 1933. p. 33-34. Primary objectives of farm-relief program and of Extension Service are identical.

Services rendered by county extension agents and what they cost. By H.W. Gilbertson. 1933. 16p. Mimeographed. U. S. Department of Agriculture Miscellaneous Extension Publication no. 4.

Farm Buildings and Equipment.

Announcing a new farm building plan service from Mid-West Agricultural Colleges. By Henry Giese. Successful Farming. v. 31, no. 6. June, 1933. p. 10-11, 14. First of series of articles describing group of farm building plans developed cooperatively by agricultural colleges in Mid-West States.

Cooperative farm building plan service. By Henry Giese. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 132.

Farm Buildings and Equipment. (Cont'd)

Cornerib for the corn belt. By M.A.R. Kelley. 1933. 26p. U.S. Department of Agriculture. Farmers' Bulletin no. 1701.

Farm structures. By Edward Richard Jones. Madison, Wis., 1933. 197p. Treatise on surveys for, and designs of systems of land drainage, irrigation, and erosion control; subdivision of fields; planning farmstead; water systems; heating and ventilating; buildings and other structures on farm, including sewage disposal systems

Mid-west farm building plan service, Catalog. 1933. Gives descriptions of large number of building and equipment plans which have been prepared cooperatively by fifteen mid-western agricultural colleges.

Movable hog houses. By William C. Skelley and E. R. Gross. 1933. 4p. New Jersey. Agricultural Experiment Station. Circular no. 276.

Practical hog houses for Indiana. By G. O. Hill and J.W. Schwab. 1933. 8p. Purdue University. Department of Agricultural Extension. Extension Bulletin no. 76.

A small shearing shed. Journal of Agriculture of South Australia. v. 36, no. 3. October 15, 1932. p. 286-287. Two main ideas have been kept in view in planning shed; the first being easy handling of wool from time it is taken off the sheep until it leaves shed in bales; the other being simplicity in form and construction of buildings.

Truck display sells farm structures. American Builder. v. 54, no. 4. January, 1933. p. 28-29. "A" type hog-house; shed type brooder house; milk house.

Farm Machinery and Equipment.

Accurate planting essential. By A.C. Sandmark. Farm Machinery and Equipment no. 1792. April 15, 1933. p. 3-5. Corn planter holds key to bigger yields.

Case "roadless" - a British adaptation. Farm Implement News. v. 54, no.9. April 27, 1933. p.14. Detail drawing of rubber-jointed track. Interlocking rubber blocks are inserted under pressure.

Chop hay to save labor and space. By R. C. Miller and E. A. Silver. Successful Farming. v. 31, no. 6. June, 1933. p. 8, 30. Ohio tests showed that it cost $1.47 a ton to store hay by chopping it. Under same conditions it cost $1.84 a ton to store loose hay. Besides that, same mow space held much more chopped hay than loose hay. Two conditions that must be watched are heat and extra weight in the mow.

Cooling water requirements of Diesel cotton gin engines. By T.M. Robie.. Cotton Ginners' Journal. v. 4, no. 7. April, 1933. p. 6, 33.

Development of haymaking machinery. By W. H. Cashmore and J.E. Newman. 1933. 58-67p. Reprinted from Empire Journal of Experimental Agriculture v. 1, no. 1.

Farm Machinery and Equipment. (Cont'd)

Development of the hay combine. By L.R. Tallman. Implement & Tractor Trade Journal. v. 48, no. 11. June 3, 1933. p. 11-12. Some engineering considerations in new unit designed for baling direct from the windrows under varied conditions.

The effect of corn plant characteristics on mechanical corn picker loss. By R. H. Wileman. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 125-126.

Farm equipment and community prosperity. 1933. 30p. Research department. National Association of Farm Equipment Manufacturers. Chicago, Ill.

Importance of proper implement display. By Lindsay M. Donaldson. Farm Implement News. v. 54, no. 9. April 27, 1933. p. 15.

Iowa college features farm machinery repair. Farm Machinery and Equipment. no. 1792. April 15, 1933. p. 6-7. Agricultural engineers, dealers and extension workers cooperate in practical educational program.

Machinery and the farm. Farm and Ranch. v. 52, no. 7. April 1, 1933. p. 11, 13. Many threshing machines. Development of planters. Implement manufacturers alert. First steel harrows. When barbed wire came in.

Manufacturers' and dealers' service to farmers. By George L. Bell. Farm Implement News. v. 54, no. 9. April 27, 1933. p. 16-17. Term service used as it applied to mechanical repairs on machines and also as it applies to general service to farmers in connection with all their problems.

More about corn planters. By C. O. Reed. Farm Implement News. v. 54, no. 10. May 11, 1933. p. 14-20. Explanation of the causes and remedies for some of more baffling troubles particularly with tractor planters.

New machinery in an off year. By E. T. Leavitt. Implement Record. v. 30, no. 6. June, 1933. p. 11-12. Refinements on implements; Improved harvesting machinery; Row-crop innovations.

No official figures on 1932 implement sales. Farm Implement News. v.54, no. 9. April 27, 1933. p. 9. Omission by Bureau of Census was part of economy program. Doubtful if special reports will be resumed in 1933.

Report on the tripod system of harvesting fodder and grain crops. The Journal of the Ministry of Agriculture. v. 40, no. 1. April, 1933. p. 3-6.

Second report of the Agricultural Machinery Testing Committee covering the period 1st April, 1930, to 31st March, 1932. 1932. 6p. Mimeographed. Gt. Britain. Ministry of Agriculture and Fisheries.

Farm Machinery and Equipment. (Cont'd)

A study of mechanical corn pickers. By Claude K. Shedd. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 123-125. Most important fact thus far developed by these tests is high rate of field losses of all machines tested. Out of forty separate tests made in 1931 and early part of 1932, there were only three in which field losses were less than 10 per cent of yield. Lowest record was 8.31 per cent and highest 54.1 per cent. In nearly all of tests losses were between 10 and 20 per cent of yield. Basic design of corn pickers as to location and arrangement of gathering points, gathering chains, and snapping rolls is practically same for all makes of pickers now on market. It is uncertain whether or not details of this design can be improved so as to reduce field losses to acceptable amount. Probably greatest obstacle in way of such improvement is difficulty in saving corn that is shelled by snapping rolls. Perhaps problem will be solved by improving details of existing basic design, or possibly it will be by discarding conventional design and incorporating some entirely new ideas.

Take-off combining: Editorial. Farm Implement News. v. 54, no. 9. April 27, 1933. p. 11. Combine operation differs from that of other machines in that separator action must be maintained at constant speed. Otherwise, if speed is excessive grain will blow over, and if speed drops, grain will not be thrashed clean, while chaffer and sieves will be overloaded. Wheel tractor should be built with power take-off gear connection ahead of main clutch, and with take-off having separate clutch that can be operated either independently or linked with main clutch throwout.

Fertilizers.

Making effective use of manures: Practical plans followed as results from careful tests. Wisconsin Agriculturist. v. 60, no. 7. April 1, 1933. p.2.

Fire protections.

Fire-resisting cotton fabric has many uses. Popular Mechanics. v. 59, no.5. May, 1933. p. 753.

Floods and Flood Control.

Inexpensive water-stage recorder developed. Engineering News Record. v.110, no. 21. May 25, 1933. p. 677. Los Angeles County Flood Control District develops instrument designed especially for intermittent use and featuring simplicity and low cost. Inexpensive recorder is weight driven through cold movement.

Suggestions and plan for a practical solution of the river improvement problem. By Christian J. Zeitinger. St. Louis, Missouri, the author, 1909 Park Avenue, 1932. 12p.

Floors.

Durable finishes for any kind of floor. By C. H. Jefferson. Quarterly bulletin. Michigan Agricultural Experiment Station. v. 15, no. 4. May, 1933. p. 282-287

Floors. (Cont'd)

Rubber covering for floors survives long wear. Popular Mechanics. v. 59, no. 5. May, 1933. p. 707. Floor covering now is being made of wood flour with rubber as binder. Process of manufacture from raw materials to finished product requires only twenty-four hours, and method of treatment is about same as for linoleum.

Flow of Water and Gases.

Flow of fluids in pipes. Pt. II. By Emory Kemler. Heating, Piping and Air Conditioning. v. 5, no. 6. June, 1933. p. 298-301. Pressure drop in pipes; Three types of flow problems; Establishing friction factor for different pipes; When pipe is not circular.

Forage Drying.

Comparative nutritional values of sun-cured and artificially-cured alfalfa hay. By L. M. Kishlar. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 129-130.

New developments in hay driers. By A. W. Clyde. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 127-129. Summary and conclusions: In thermal efficiency there seems to be no great difference between conveyor and rotary-drum driers. 2. Progress in reducing losses in exhaust gases will be rather slow from now on unless these gases are used to preheat green hay. 3. There is still opportunity to reduce cost or drying by reducing losses of heat.

Power, labor, and fuel requirements of artificial driers. By Harold T. Barr. Agricultural Engineering. v. 14, no. 5. May, 1933. p. 131-132.

Frost Protection.

Fighting frosts. By Mac Noble Rineman. Country Gentleman. v. 103, no.3. March, 1933. p. 14-15, 46.

Fuels.

Alco-gas project. Farm Implement News. v. 54, no. 9. April 27, 1933. p.8. Studies to be carried on by Society of Automotive Engineers, Fuel Research Committee and technical experts of automobile and oil companies.

Alcohol fuel defended. Oil, Paint and Drug Reporter. v. 123, no. 16. April 17, 1933. p. 30A-30C. Dr. Henry Arnstein, consulting chemical and industrial engineer, Philadelphia, has furnished the Reporter with a commentary on the criticism of alcohol in motor fuels by Dr. Gustav Egloff.

Alcohol fuel idea criticized. Oil, Paint and Drug Reporter. v. 123, no.15. April 10, 1933. p. 15, 34. Dr. Gustav Egloff, research oil chemist associated with Universal Oil Products Company, Chicago asserted that farmer is "chasing a mirage" which in end will do more harm than good, and will contribute nothing to his relief.

Fuels. (Cont'd.)

Alcohol-gasoline blends. Study of the economic aspects, technical factors, and the experience of users abroad. New York, American Petroleum Industries Committee; 1932. 16p.

Alcohol in motor fuel bill ready. Oil, Paint and Drug Reporter. v. 123, no. 17. April 24, 1933. p. 14, 40, 57. Federal officials endorse measure requiring refiners to purchase 2 per cent or pay tax.

Alcohol in motor fuel has new phase. Oil, Paint and Drug Reporter. v. 123, no. 16. April 17, 1933. p. 16. Rising price of corn brings question of need, but farm organizations see permanent benefits.

Alcoholized gasoline approved in tests. Science News Letter. v. 23, no.631. May 13, 1933. p. 301-302.

Facts about alcohol in motor fuel. By D. H. Killeffer. 8p. 1933. Reprinted from news edition. Industrial and Engineering Chemistry. v. 11, no. 8.

Gasoline-alcohol mixture for motor fuel. By U.S. Department of Agriculture. Farm Implement News. v. 54, no. 11. May 25, 1933. p. 14-15.

Gum formation in gasoline. By T. H. Rogers and Vandeveer Voorhees. Industrial and Engineering Chemistry. v. 25, no. 5. May, 1933. p. 520-523. Control of gum formation in gasoline by antioxidants.

Motor fuel from grain. New England Homestead. v. 106, no. 7. April 1, 1933. p. 2. Agricultural engineers estimate that mixture of 10% of alcohol with gasoline would create market for our entire grain surplus as well as grain now used in producing surplus stock. That such a mixture is practical has been demonstrated by Iowa State College. Gasoline blended with 10% such alcohol results in mixed fuel which performs well in ordinary motors and has high anti-knock and acceleration qualities. With corn at 60 cents per bushel, a price which would restore a large measure of buying power in corn belt states, motor fuel containing the 10% alcohol mixture would cost 3 cents per gallon more than ordinary gasoline, or the equivalent of anti-knock motor fuels. Engineers state that mixture of eight parts ethyl and two parts butyl may be blended with gasoline up to at least 20% without any change in engine or carburetor design.

Motor fuels, their production and technology. By Eugene H. Leslie. New York, Chemical Catalog Company, Inc., 1923. 681p. Alcohol, motor fuel of the future. p. 482-508.

Predicting stability of gasolines to aging. By Carl Winning and R.M. Thomas. Industrial and Engineering Chemistry. v. 25, no. 5. May, 1933. p. 511-516.

Significance of A.S.T.M. distillation curve. By M.G. Blair and R.C. Alden. Industrial and Engineering Chemistry. v. 25, no. 5. May, 1933. p. 559-562. Previous contributions relating A.S.T.M. distillation curve of motor fuels to automobile performance are briefly reviewed.

Fuels. (Cont'd)

Solubility of ethyl alcohol in gasoline. By Oscar C. Bridgeman and Dale Querfeld. Industrial and Engineering Chemistry. v. 25, no. 5. May, 1933. p. 523-525. Editorial, p. 477-478.

System Ethyl Alcohol-n-Heptane at 30°C. By J. B. Ferguson, M. Freed and A. C. Morris. The Journal of Physical Chemistry. v. 37, no. 1. January 1933. p. 87-91

Tractor fuels. By E. C. Sauve. Quarterly bulletin. Michigan Agricultural Experiment Station. v. 15, no. 4. May, 1933. p. 287-292. Gasoline, kerosene, and distillate fuels; fuel value by distillation; value of a fuel in an engine; heating value of the common fuels; and oil as a tractor fuel; alcohol and gasoline blends; economics of motor fuels; conclusions.

Garages.

New styles in garages and equipment. American Builder and Building Age. v. 55, no. 1. April, 1933. p. 30-31.

Gas producers.

Untersuchungen an Holzgaser-zeugern. By G. Kuhne, E. Fischer and F. Koch. Technik in der Landwirtschaft. v. 13, no. 6. June, 1932. p. 124-127. Experiments with gas producers. Concerns tests with experimental motors and different kinds of wood and various sizes of blocks. Includes description and tests of small gas producer. Compares tests of same motor on benzol and producer gas.

Hay.

Marketing hay by modern methods. By G. A. Collier. 1933. 26p. U.S. Department of Agriculture. Farmers' Bulletin no. 1700.

Heating.

Construction of furnace walls, hearths, doors and other parts. By F. H. Norton. Fuels and Furnaces. v. 11, no. 3. May-June, 1933. p. 86-96. Discussion of modern methods employed in the design and construction.

Selecting the design or outside temperature for heating calculations. Heating and Ventilating. v. 30, no. 5. May, 1933. p. 33-36.

Hotbeds.

Garden heated with furnace grows crops in winter. Popular Mechanics. v. 59, no. 5. May, 1933. p. 741. Parallel lines of tile in ground three feet apart, attaching one end of each pipe to furnace oven and erecting chimney over other end. To equalize temperature over warmed area and to insure draft, tile at ovens is buried two feet underground, slanting upward to chimneys where it is only five inches beneath soil.

Houses.

Fireproof concrete homes may be built at moderate cost. Concrete. v. 41, no. 5. May, 1933. p. 3-4. Concrete floors are most important feature. Contractor plans for fireproof homes.

Inexpensive homes of steel built like refrigerators. Popular Mechanics. v. 59, no. 5. May, 1933. p. 756. Constructed of tubular steel studs, filled with concrete and so made as to accept standard metal vertical panels for exterior wall surfaces and insulation-board panels for interior walls. Studs are set into pockets in concrete foundation, and exterior walls may be treated with various forms of metal paint or with special paint mixed with concrete. Galvanized iron, copper, aluminum or other metal of equivalent strength can be used for walls. Ceiling construction consists of metal joists designed to accept insulation board panels, on top of which three inches of loose-fill insulation is applied. Inexpensive electric heating and cooling system is installed in each unit along with simple air-conditioning unit.

Newest ideas in home building at a Century of Progress. Brick & Clay Record. v. 82, no. 5. May, 1933. p. 158-159. Reinforced brick masonry house set up in company with buildings of porcelain enameled steel, glass, wood and other materials.

Houses, Remodeling.

Better homes and gardens report eighty-five per cent of all homes need remodeling. Building Material Digest. v. 2, no. 5. May, 1933. p.6,9. Organized for sole purpose of promoting sale of home equipment, house furnishings, and building materials, more than 130 Better Homes Contests will get under way this spring. They will be operated in co-operating with newspapers and most of them will be coordinated with the National Better Homes Contest sponsored by Better Homes and Gardens.

Hydraulics.

Hydraulic losses in short tubes determined by experiments. By John A. Oakey. Engineering News-Record. v. 110, no. 22. June 1, 1933. p. 717-718.

Hydraulic machinery. By Daniel W. Mead. New York. McGraw-Hill Book Company, Inc., 1933. 396p.

Insulation.

Aluminum foil insulation. Refrigerating Engineering. v. 25, no. 5. May, 1933. p. 264. Conclusions: 1. Aluminum foil insulations of plain air-cell type and approximately 2 in. thick have been tested in guarded hot plate apparatus; Most efficient structures were found to approach conductance of still air. 2. Aluminum foil insulations with corrugated separators between sheets of aluminum foil were slightly inferior to plain air-cell type. 3. Insulation structures containing crumpled foil were somewhat inferior to corrugated structures. Amount of heat transmitted by convection appeared to be greater. 4. Typical cold box apparatus was used as check upon results obtained by guarded hot plate apparatus. Results obtained showed good agreement between two methods of

Insulation. (Cont'd)

testing. 5. Aluminum foil makes excellent radiation shield, and with aluminum foil it is easy to eliminate practically all of heat ordinarily transmitted by radiation in insulation of air-cell type.

Insulating data. By Dr. Ezer Griffiths. Ice and Cold Storage. v. 36, no. 421. April, 1933. p. 60. Various testing apparatus and the calculation of heat flow.

Insulation of new and old houses. G. D. Mallory. National Development Bureau. Department of Interior in cooperation with Dominion Fuel Board. Ottawa, Canada. No. 15, 1932. 73p. Unusual methods of heat insulating new and old houses; principal types of insulating materials used; available heat; heat loss; heat insulation; acoustical materials for houses; lumber and heat insulation; general rules for use of insulators; choosing heat insulator; cost; reduction of heat transmission losses; when to insulate old house; reduction of air infiltration losses.

Insulation of open hearth furnaces. By E. F. Entwisle. Fuels and Furnaces. v. 11, no. 3. May-June, 1933. p. 105-110.

Sound insulation minus the mystery. By D. P. Falconer. American Builder and Building Age. v. 55, no. 1. April, 1933. p. 38-39. How to correct noise-leaking walls, floors and ceilings.

Irrigation.

Contour orchard irrigation. California Cultivator. v. 80, no. 11. April 29, 1933. p. 211, 227.

Defeating drought with power irrigation. By R. C. Heinton. Electricity on the Farm. v. 6, no. 5. May, 1933. p. 8-9, 11. Irrigation by one method or another, on both large and small scale, is being practiced quite extensively by growers in this territory who are practically unanimous in their belief that irrigation is not just added expense in their farm practice, but rather crop insurance to protect large investment that they already have.

Financial and general data pertaining to irrigation, reclamation and other public districts in California. Prepared under direction of California irrigation and reclamation financing and refinancing commission. Sacramento, California State Printing Office, 1931. 255p. California. Division of water resources. Bulletin no. 37.

Irrigation economies: Editorial. California Cultivator. v. 80, no. 11. April 29, 1933. p. 210.

Irrigation pays in Western Pennsylvania. By B. W. Faber. Electricity on the Farm. v. 6, no. 6. June, 1933. p. 10-11.

Irrigation work in the Indian Bureau. Engineering News-Record. v. 110, no. 22. June 1, 1933. p. 712-714. On Indian reservations in the West there are a number of reclamation projects operated by the Bureau of Indian Affairs for the purpose of helping the Indian to become self-supporting. Wapato project. Minor projects.

Irrigation. (Cont'd)

Measure irrigation water. The Washington Farmer. v. 68, no. 12. May 18, 1933. p. 6. It has been found at the irrigation branch experiment station that water requirements for various crops grown on fine sandy loam soil are as follows: Ten-year-old apple trees with excellent alfalfa cover crop, 40 acre inches; alfalfa hay, 40 acre inches; potatoes and corn, 30 acre inches; wheat 24 acre inches. Under ordinary conditions, two acre inches of water are required per foot of soil to fill it to field capacity.

New grader blade makes new irrigation furrow. Farm Implement News. v. 54, no. 11. May 25, 1933. p. 15. Designed by engineers of the Bureau of Agricultural Engineering, U. S. Department of Agriculture. In making furrows, new blade causes minimum of soil disturbance, which affords tree roots greater activity at shallow depth where maximum amount of plant food is located. Grader blade is attached to rear of ordinary furrowing out shovels and shapes furrows with side slope of 3 horizontal to 1 vertical instead of usual 1 to 1 shape.

Precautionary measures in citrus irrigation. By W. H. Williams. California Cultivator. v. 80, no. 11. April 29, 1933. p. 219.

Production and utilization of corn grown under irrigation in Washington. By H. P. Singleton. 1933. 22p. Washington. Agricultural Experiment Station. Bulletin no. 278.

Rain when needed. By Jack Klein. California Cultivator. v. 80, no. 11. April 29, 1933. p. 211, 227. Discussion of portable overhead sprinkler system.

Spray irrigation. By R. U. Blasingame. Pennsylvania Farmer. v. 108, no. 10. May 13, 1933. p.5.

Studies in water conservation. By S. H. McCrory. California Cultivator. v. 80, no. 11. April 29, 1933. p. 213, 225.

Land.

Problems of "submarginal" areas, and desirable adjustments with particular reference to public acquisition of land. Washington, U.S. Government Printing Office. 1933. 24p. National land use planning committee and National advisory and legislative committee on land use. Publication no.6.

Proceedings of the first Missouri conference on land utilization. University of Missouri, College of Agriculture. February 23 and 24, 1933. 1933. 62p. Missouri Agricultural Experiment Station Bulletin no. 323.

Public domain of Nevada and factors affecting its use. By E. O. Wooton. 1932. 52p. U. S. Department of Agriculture. Technical Bulletin no. 301.

State land-settlement problems and policies in the United States. By W. A. Hartman. 1933. 88p. U.S. Department of Agriculture. Technical bulletin no. 357.

Land. (Cont'd).

Trends in the use of farm lands in the upper peninsula of Michigan. By E.B. Hill. Quarterly bulletin. Michigan Agricultural Experiment Station. v. 15, no. 4. May, 1933. p. 227-231.

Miscellaneous.

Automotive electricity. By Earl L. Consoliver. Revised by Beverly B. Burling. 2d edition. New York, McGraw-Hill Book Company, Inc., 1932. 609p. Text and reference work on construction, operation, characteristics, maintenance, testing and repair of automotive ignition, starting, lighting and storage battery equipment.

Annual report for fiscal year ending November 30, 1932. 1933. 68p. Massachusetts Agricultural Experiment Station Bulletin no. 293. Department of Agricultural Engineering, p. 7-8.

Drawings printed in colors replace blueprint. Popular Mechanics. v. 59, no. 4. April, 1933. p. 520. By printing from positive tracing instead of negative, these color relations are reversed, securing white lines on red, green lines on black, yellow lines on black or rose lines on black. Since paper on which this work is done is never wet, time of drying prints is saved for busy drafting rooms. After exposure, papers are rolled loosely and placed in glass case, at bottom of which is vessel of amonia. Development may be observed through glass.

Government economies. By Herbert D. Brown. Annals of The American Academy of Political and Social Science. v. 165. January, 1933. p. 138-145.

How can Federal expenditures be reduced? By Lillian M. Gilbreth. Annals of The American Academy of Political and Social Science. v. 165. January 1933. p. 125-130.

Minutes of proceedings of the Institution of Civil Engineers. London, the Institution, 1933. 422p.

Nineteen contracts under way on Colorado river aqueduct. Engineering News Record. v. 110, no. 21. May 25, 1933. p. 678-680. Present construction operations include 126 miles of roads, 390 of transmission line and 178 of water line. Camps opened for 26 miles of Coachella tunnel force account work. San Jacinto tunnel contract under way. Bids for 22 miles of additional tunnel called.

Reducing Federal expenditures. By Henry P. Seidemann. Annals of The American Academy of Political and Social Science. v. 165. January, 1933. p. 131-157.

Some sound-absorbing research. By Samuel R. Lewis. Aerologist. v. 9, no.6. June, 1933. p. 5-7, 16-18.

Stone decay. By E. F. Power. The Structural Engineer. v. 11, (New series) no. 1. January, 1933. p. 15-28.

Summary report of progress, 1932. 1932. 308p. Maine. Agricultural Experiment Station Bulletin no. 363.

Miscellaneous, (Cont'd)

Twenty-first annual report of Purdue University. July 1, 1931-June 30, 1932. Agricultural Extension Work in Indiana. 1933. 84p. Division of Agricultural Engineering. p. 14-16.

Why governmental control? By I. J. Fairchild. Commercial Standards Monthly. v. 9, no. 11. May, 1933. p. 251-253. Can quality standards be made effective without government control?

Motors.

New developments in synchronous motor control. By M. N. Halberg. General Electric Review. v. 36, no. 5. May, 1933. p. 244-249. Functions of synchronous-motor controllers. Control of primary connections to the motor. Control of connections to motor field. Relays for transfer, field application , and field removal. Protective features.

Muscle Shoals.

Power economics of the Tennessee Project. Electrical World. v. 101, no. 19. May 13, 1933. p. 604-607. Potential outputs are far in excess of any likely demand.

Painting.

Paint seals concrete floor against moisture. Popular Mechanics. v. 59, no. 4. April, 1933. p. 567. Walls and floors of brick, concrete, stone, tile or cement-block structure are sealed against seeping water. Cracks and holes are first filled with cement preparation to provide base for waterproofing paint, which is then applied with a brush. Two colors, aluminum or black are available.

Pipes and Piping.

Practical piping data on modernizing. By John A. Masek. Heating and Ventilating. v. 30, no. 5. May, 1933. p. 9-12.

Wrought-iron and wrought-steel pipe valves, and fittings. 2d edition. October 1, 1932. Washington, U.S. Government Printing Office, 1933. 12p. Simplified practice recommendations R 57-32.

Poultry Houses and Equipment.

How to raise chicks. By C. W. Carrick. 1933. 20p. Purdue University. Department of Agricultural Extension. Extension Bulletin no. 177.

Power.

Proceedings of the sixth Oil Power conference held at the Pennsylvania State College, June 8 to 11, 1932. 1933. 171p. Pennsylvania State College. School of engineering. Technical Bulletin no. 16.

Tractor and horse power in the wheat area of South Dakota. By C. M. Hampson and Poul Christopherson. 1932. 39p. South Dakota Agricultural Experiment Station, Circular no. 6.

Public Works.

Industrial recovery bill. Commercial and Financial Chronicle. v. 136, no. 3545. June 3, 1933. p. 3781-3782.

Public Works and the State. By Edward Hyatt. Engineering-News-Record. v. 110, no. 20. May 18, 1933. p. 617-620. Outlines scope of operations. Irrigation districts, which are state agencies, receive merited attention.

Public works bill for national recovery. Engineering News-Record. v. 110, no. 21. May 25, 1933. p. 687-690. Principal provisions of proposed legislation through which federal government will build and will assist states, cities and counties to build $3,300,000,000 worth of needed public works. Trade associations prepared for group action. Editorial. p.694-5.

Public works in the Federal Service. By Harold L. Ickes. Engineering News-Record. v. 110, no. 20. May 18, 1933. p. 613-617. Vast scope of federal works. Irrigation work. Work in the national parks. Construction in the Indian Service.

Service requirements determine public-works construction. By Malcolm Pirnie. Engineering News-Record. v. 110, no. 20. May 18, 1933. p. 625-628. Three functions are served. Neglected needs. Specific examples.

Pumps and Pumping.

Automatic devices make centrifugal pumps self-priming. Power. v. 77, no.6. June, 1933. p. 302-303. Devices are described that may be attached to centrifugal pumps to make them self-priming.

Equipment progress aids pumping and distribution. By Theodore A. Leisen. Engineering News-Record. v. 110, no. 23. June 8, 1933. p. 754-756. Pumps, pipes, valves and services have shared in the general advance toward efficiency, durability and lowered operating costs.

Reclamation.

Laundering of soil restores most of its productivity. Popular Mechanics. v. 59, no. 4. April, 1933. p. 589. In Imperial Valley, California, miles of land which appears waste today was once productive, but was ruined by excessive irrigation without proper drainage. Water table gradually rose until it stood within a few inches of surface, and the evaporation of moisture caused heavy deposit of salts. Percolating through soil, water dissolves salt and then both salt and water are carried away through drainage canals. By such processes, areas of land are being reclaimed in about six months.

Reclaiming Imperial Valley salt lands. California Cultivator. v. 80, no.11. April 29, 1933. p. 218. Saline salts can be removed from land by systematic washing, or "leeching" with irrigation water that comes from Colorado River.

Reclamation of new lands by irrigation. By M. E. Bonis. California Cultivator. v. 80, no. 10. April 15, 1933. p. 187, 207.

Refrigeration.

Choice and selection of electric motors for driving compressors. Refrigeration, Cold Storage and Air Conditioning. v. 5, no. 12. March 31, 1933. p. 15-17.

Physical phenomena of solid CO_2. By Bernard C. Oldham. Ice and Cold Storage. v. 36, no. 421. April, 1933. p. 61-69.

Refrigerant from flue gas utilizes waste product. Popular Mechanics. v. 59, no. 4. April, 1933. p. 502. Made practical, as results of experiments begun by Prof. Hamilton P. Cady at University of Kansas.

Refrigerated bodies have hot prospects. Commercial Car Journal. v. 45, no. 2. April, 1933. p. 14-16.

Roofs.

How to straighten a barn roof. Business Material Digest. v. 2, no. 5. May, 1933. p. 10. Two three-eighths-inch rods were put across barn from plate to plate. Rods had about foot of threads on each end. Sides were drawn in by tightening nuts on rods, and at same time raising roof with jack-screws. Rods were placed between driveway and mow, and were left in place.

Lightweight roof and floor construction. The Architectural Record. v. 73, no. 4. April, 1933. p. 282-283. Lightweight steel floor. Pressed steel floor. Pressed steel Z shapes for floors and walls. Fireproof plank floor. Prefabricated steel concrete floor. Floor and roof construction intended for mass production.

Roofs for hen-houses. By Burt W. Heywang. Arizona Producer. v. 12, no.6. June 1, 1933. p. 3. Corrugated iron satisfactory in Arizona if space below is well ventilated.

Silos.

Trench silos meeting need for low-cost feed storage. By O.J. Tremary. Furrow. v. 38. May-June, 1933. p. 3, 10.

Soils.

Alkali problem in California. Resume of talk by Dr. W.P. Kelley. California Citrograph. v. 18, no. 4. February, 1933. p. 98, 114-115.

Buffer capacity of peat soils. By B. D. Wilson and M. J. Plice. 1933. 11p. Cornell University. Agricultural Experiment Station. Memoir no. 146.

Standardization.

Standardization and research. By Henry D. Hubbard. Commercial Standards Monthly. v. 9, no. 11. May, 1933. p. 247-249. Standardization is a continuing process whose aim is not fixity or stagnation but to apply and generalize new science in design of construction.

Storage.

Plan for a farm storehouse of low cost construction suggested. Texas. Extension Service Farm News. v. 18, no. 9. June, 1933. p. 3. Its cost, if made of new materials, would run less than $100.

Studies of potato storage. By Ora Smith. 1933. 57p. Cornell University. Agricultural Experiment Station Bulletin no. 553.

Temperature.

Soil temperature in citrus groves. By G.E.P. Smith. Arizona Producer. v. 12, no. 6. June 1, 1933. p. 10. Outstanding features of soil temperature as revealed through these studies are: 1. Soil temperature is product of three factors: air temperature in contact with soil, insolation or radiant energy received in direct sunlight and water evaporation at or near soil surface. 2. Changes in temperature at surface are transmitted downward, not rapidly but very slowly. 3. Amplitude of daily range increases rapidly with depth.

Terracing.

Terracing for erosion increases land value. Arizona Producer. v. 12, no. 5. May 15, 1933. p. 4. Terracing of cultivated lands in Texas and Oklahoma to control soil erosion has increased their value on average of $8.25 per acre.

Texas terracing job is one-fourth finished. Farm and Ranch. v. 52, no.8. April 15, 1933. p. 12. Total of 110,000 Texas farms have one or more terraced or contoured fields aggregating 6,291,000 acres, and 18,375,000 more acres need terracing.

Tires.

Farmers approve new air tires. Implement & Tractor Trade Journal. v. 48, no. 10. May 20, 1933. p. 8-9. New equipment demonstrating its place on the farm in variety of farm operations this spring throughout the Middle West.

Tractors.

Are we coming to high-compression tractor engines? P.M. Heldt. Automotive Industries. v. 68, no. 18. May 6, 1933. p. 556-558, Tractor engine working 35 days a year could be made to have satisfactory life if designed to develop one hp. per 5 cu. in. Average data of gasoline-burning tractor engines given in table.

Build this simple garden tractor. Popular Mechanics. v. 59, no. 4. April, 1933. p. 650-653.

Higher tractor test fee. Farm Implement News. v. 54, no. 11. May 25, 1933. p. 8. Effective May 10, fee for testing tractor at University of Nebraska was raised to $500, by amendment to Nebraska tractor test law introduced by Representative W. F. Crozier of Polk Co. Increase was prompted by desire to make tractor test work as nearly self-supporting as possible so as to avoid drawing on heavily-reduced appropriation to University.

Ventilation.

Relation of ventilation in an electric brooder to health and growth of chicks. By J. E. Dougherty and B. D. Moses. Poultry Science. v. 12, no. 2. March, 1933. p. 141-143. Passing of 1 cubic foot of air per minute per 100 chicks through brooder appeared to meet needs of chicks until they were two weeks of age, and then had to be increased to prevent excessive condensation and injury to chicks from oxygen depletion of air or other causes.

Walls.

Wall systems. The Architectural Record. v. 73, no. 4. April, 1933. p. 284-287. Exterior walls and partitions of metal-clad insulation board. Wall of panel construction. Dry-assembly wall. Insulation value of aluminum foil. Wall construction intended for mass production. Frameless wall construction. Wall of sheet steel.

Water analyses.

New "standard methods" shows growth of science. By Harry E. Jordan. Engineering News-Record. v. 110, no. 23. June 8, 1933. p. 748-749. Brief commentary on the seventh edition of "Standard Methods for the Examination of Water and Sewage," contrasting it with former editions and tracing the scientific developments embodied in its text.

Water Power.

Sixth annual report of Division of Water Power and Control for the year December 31, 1932. 1933. 26p. New York. Conservation Department Drainage, p. 13-16.

Water Supply.

Notable improvements in groundwater development. By O.E. Meinzer. Engineering News-Record. v. 110, no. 23. June 8, 1933. p. 750-752. Hydrologic studies made by federal and state agencies in many sections allow rational design of groundwater supplies. Advances in equipment design remedy numerous former handicaps.

Report of Kings river water master for period 1918-1930. Sacramento, California State Printing Office, 1932. 426p. California, Division of Water Resources. Bulletin no. 38.

Running water in the home. Southern Agriculturist. v. 63, no. 4. April, 1933. p.5.

South coastal basin investigation records of ground water levels at wells, 1932. Sacramento, California State Printing Office, 1932. 590p. California, Division of Water Resources. Bulletin no. 39.

Weeds.

Experiments with chemical weed killers. By J.E. Howitt and W.M. Gammon. Canadian Engineer. v. 64, no. 14. April 4, 1933. p. 15-16. Tests with commercial weed killers and chemicals described and results obtained.

Weeds. (Cont'd).

Objects of experiments: 1. To determine what commercial weed killers and other chemicals would destroy more common of our troublesome weeds. 2. To ascertain the practicability of using chemical herbicides to destroy weeds in small patches and in large field areas. 3. To record residual effect of chemical weed killers on succeeding crops. 4. To find out what changes have taken place in tissues of plants treated with various chemicals. Chemicals and commercial weed killers experimented with: sodium chlorate, atlacide, weed cop, Fermite, Hofer's weed killer, anhydrous copper sulphate, iron sulphate, potassium chlorate, copper sulphate, Raphanite, Perfectso weed killer no. 1; Perfectso weed killer no. 2, Weedicide, McDougall's weed killer, water gas lime, extract from pulp mill, creolin, formalin, waste motor oil, soda ash, calcium chloride, Kirkland's weed killer, calcium cyanamide.

Fallowing for weed suppression. By W. E. Brenchley and K. Warington. The Journal of the Ministry of Agriculture. v. 40, no. 1. April, 1933. p. 32-41.

Waging war on Canada thistles. By A. L. Stone. Hoard's Dairyman. v. 78, no. 7. April 10, 1933. p. 141. Simple and practical methods for eradication of this pest are proposed to meet varying conditions as they may exist on any particular farm.

Welding.

New automatic welding process. By T. M. Rude. Refrigerating Engineer. v. 25, no. 5. May, 1933. p. 247-249.

Windmills.

Wind turbine generates electricity for farm. Popular Mechanics. v. 59, no.5. May, 1933. p. 752. Feature of the unit is self-adjusting variable-pitch blade, which operates successfully in both low and high winds. Hollow blade, produced by new process of welding stainless steel resembles half of airplane propeller and is shaped like airplane wing. If wind reaches high velocity, blade is so designed that it spills surplus, making possible constant operating speed.